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MAY MEETING

The May meeting in Boston was marked by an earnestness and keen interest unsurpassed in the history of the Society. It emphasized to many members the fruitfulness of intensive discussion, and the unique influence our Society, even though small, can exert if quality, rather than quantity continues to determine its future growth. The arrangements made by the local committee, of which Mr. A. E. Barter was the active chairman, produced almost ideal conditions, and everything went without a hitch. A feature of the meeting was the visit to the Watertown Arsenal, where Col. Wheeler's courteous preparation was appreciated by all. To him and to Mr. Barter the Society owes a large part of the success of the occasion.

NEXT MEETING

Friday, October 22, and Saturday, October 23
Philadelphia, Pa.

Friday, October 22

EVENING SESSION, MEMORIAL TO FREDERICK W. TAYLOR.
8.15 P. M., Houston Hall, University of Pennsylvania. The program, as arranged by the governing board, includes four principal speakers who will treat of important periods in Mr. Taylor's career and important phases of his work. Distinguished leaders in the movement in foreign countries are preparing appreciations to be read at this session. Among these are Professor A. Wallichs, Royal Polytechnical School, Aix-le-Chapelle; M. Henri Le Chatelier and M. Charles de Freminville, Paris; M. Charpy, Director of the St. Jacques Steel Works; Professor J. J. Sederholm, University of Helsingfors, Finland.

Saturday, October 23

MORNING SESSION. Leave headquarters (to be announced) 9 A. M. in automobiles arranged for by the committee, drive through Fairmount Park to "Boxly", Mr. Taylor's home at Chestnut Hill, where the party will be the guests of Mrs. Taylor.

LUNCHEON, at "Boxly".

AFTERNOON SESSION, at headquarters. Paper by Richard A. Feiss, of the "Clothcraft Shops" in Cleveland, O., giving details of the social service work in his concern. Illustrated.

DINNER, at headquarters.

EVENING SESSION, at headquarters. Discussion of Mr. Feiss' paper.

ADDITIONAL MEETINGS, 1915-16

December, 1915. New York City.
Annual business meeting and election of officers. Topic for papers and discussion: "Time Study".

February, 1916. Boston.
Topics for papers and discussion: "Fatigue" and "Profit Sharing".

May, 1916. Detroit and Ann Arbor.
Conference and round table discussions on the present state of Scientific Management in various industries.

COMMENT AND NEWS

Members who expect, even though they cannot be sure, to attend the October meeting in Philadelphia are requested to advise the Secretary at once, indicating at the same time the probable number of guests. This information is important to help those making the plans. Early in October a notice, with return post card, will be sent each member for final statement of intention. Please help by making the preliminary statement now.

The report of the Committee on Revision of the Constitution submitted in Boston opened up a discussion showing such diversity of opinion that it was referred back to the committee for further report at the October meeting. The committee was instructed to prepare a digest of proposed amendments and send copies to the members for an expression of their views. Members will probably receive this digest within a short time and are urged to send their comments promptly to the chairman of the committee.

President Person has appointed Mr. John H. Williams as a representative of the Society to confer with the Joint Committee on Classification of Technical Literature. The work this committee undertakes in connection with engineering and general indexing was described at the Boston meeting by Mr. I. Winthrop Ames, librarian of the Stone & Webster, Inc.

The first solid stone in the foundation of one of our air-castles was laid at the May meeting by Mr. George D. Babcock. He presented to the Society for its archives a complete Miscellaneous Stores Classification, as compiled for the H. H. Franklin Manufacturing Co., Syracuse, N. Y., in consultation with Mr. Carl G. Barth. As President Person remarked, this is an example which it is hoped many members will follow. One of the important services the Society can render is the accumulation and care of such documents of value proven in practical use. The only way such a service can become real is by the active coöperation of members. Will you not help to make this "service the Society *can* render" become a "service the Society *does* render"? The thanks of the Society go to Mr. Babcock and the officers of the Franklin Company for this first gift.

Owing to considerations of health, Mr. Robert Thurston Kent, the first secretary of the Society, resigned his duties last month. Mr. Kent was one of the first editors of a technical periodical to champion the cause of Scientific Management. From the beginning, in addition to his other interests, he has devoted a large amount of work to the interests of the Society. By his resignation the Society loses one to whose official connection it is indebted for an important part in the promotion of its welfare during its establishment and early growth. Mr. Henry Wood Shelton has been elected to fill the unexpired term of Mr. Kent.

INDIVIDUALITY IN INDUSTRY[1]

A paper emphasizing the necessity of giving individuality to the industrial unit itself, and how it can be accomplished.

By Robert B. Wolf[2]

About three years ago I was asked by the "Committee on Economic Administration of Industrial Establishments" of the American Society of Mechanical Engineers what I considered to be the "new element in the art of management." At that time, while the general principles of what I wish to present for your consideration today were in my mind, they were more or less indefinitely formulated and I hesitated to give them expression. Since then, however, I have had ample opportunity to verify my earlier conclusions and have put many of them into actual practice.

In presenting for your consideration my conception of progressive industrial organization, I do not wish to have it understood that I am attempting to elaborate on the methods of Mr. Taylor and others, nor do I wish to detract in any way from the splendid work done by these men. I hope that this paper, however, will show that there is a relationship between the various methods and will point out how they are all forward steps in the great movement which increases man's productiveness and his creative powers.

In order to give you my ideas more clearly, a general review of present conditions in the industrial world seems to me necessary.

Many of you have undoubtedly had more or less opportunity to observe the deplorable inefficiency of most of our large industrial concerns, especially those commonly known as trusts, where a number of formerly independent plants have been united under one common management. The plants are usually scattered over a considerable area and the central offices located in some commercial center.

The first step in the organization of these corporations has usually been the removal of the resident owners and managers from the various localities to the central offices and the subsequent attempt to carry on the functions of management by the superintendent and heads of departments. These men, in most instances, not having had any real knowledge of manufacturing costs and profits, are, of course, incapable of conducting the business intelligently. It, therefore, becomes necessary for the central office to perform much of this work for the various plants.

As a rule, no final manufacturing costs are made at the plant and as a consequence those who are held directly responsible for the cost of producing and who have the most intimate knowledge of operating conditions have not a very intelligent basis upon which to work. They can receive very little help from the former managers; in the first place, because these managers are so far removed from the actual conditions that their judgment is affected; and in the second place, their interest is divided among so many different plants that, in the very nature of things, they cannot give the various problems the time required for intelligent consideration.

A realization of the impossibility of keeping close watch on details at a distant plant is perhaps responsible for the removal of some of the vital functions of the individual plants to the central offices, such as Purchasing, Selling, Construction and Maintenance, Cost-keeping, etc.

A central purchasing department has undoubtedly many advantages, but as ordinarily conducted in large corporations these advantages are almost entirely offset by the obstacles placed in the way of free choice on the part of the mill organizations and the consequent discouragement of individuality in making selections. The impossibility of handling all of the purchases by one capable man necessitates delegating a lot of minor purchases to subordinates, who have no real knowledge of actual mill requirements. Even though they know what is required in one mill, they cannot know in others where conditions are not the same.

The purchasing agent should have full power to build up an efficient organization for keeping informed of the market conditions, so that requisitions from the mills can be handled with promptness and dispatch. The department should be able to furnish full, complete information to the individual plants whenever they need it in order to properly purchase supplies. It should encourage the mills to furnish specifications and welcome attempts on their part to keep comparative records for the purpose of determining the best materials to use. It should always conduct itself toward each separate organization as if it were an outside firm, employed to give advice and assistance in every way possible to enable purchases to be made economically. Each plant should receive frequent reports from the purchasing department, giving complete information about materials found to be giving good results in other places. This one feature alone would make it immensely valuable to the parent corporation.

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(1) A paper presented at the Boston Meeting of the Society to Promote the Science of Management, May 21, 1915.

(2) Manager of Manufacturing, Burgess Sulphite Fibre Co., Berlin, N. H.

I have dwelt upon these details merely to show how greatly a central purchasing department can aid if put in its proper relationship to the various plants, namely, that of servant rather than the equal of the manufacturing department. Certainly nothing can be more important to manufacturing than the proper purchasing of materials which are to be converted into the finished product or which are needed to affect this conversion.

Let us take accounting next. Why are accounts kept and what is their purpose? In the last analysis, accounts are records of the progress of accomplishment and are used to enable those in charge of the corporation's affairs to decide upon the future policy to pursue.

Why, then, should any attempt be made by the central office to keep accounts that are of strictly local interest to the individual plants? And why even attempt to dictate how and when these accounts should be kept? In so far as comparisons between individual plants are concerned, this is justified, but no further, and even in this case it should not be pushed to a point where comparisons which local conditions at the plants demand are not allowed.

The foregoing should not be misconstrued to mean that I believe a central accounting system for corporations is not necessary or desirable, for it most certainly is. The accounting department should confine itself, however, to such accounting as is of inter-plant nature, and not attempt to dip into local conditions, except in an advisory capacity.

One serious mistake often made is allowing the accounting department to practically control the mill offices. These, for reasons to be pointed out later, should be entirely under the control of the local management, subject, of course, to frequent auditing by the accounting department.

The central office of the corporation needs only resultant figures giving a true record of the progress of each plant, and made in such a way that comparisons can be easily made, the local plants being required to furnish any figures called for at all times.

The selling, in most cases, can be handled by the central office much better than any other function; indeed, the main purpose in forming large corporations was primarily to stop ruinous competition between plants, especially in periods of slight demand. There should, however, be much closer touch between the selling department and the mills and a much more intimate knowledge of operating conditions by the salesmen. The degree of this intimacy is, of course, one of the important things to be decided by the chief executive.

"Maintenance and construction" is another thing which should be touched upon. There is usually much damage done to the individual plants by decisions of "absentee" engineers, whose knowledge of the plant conditions cannot be of such an intimate nature that they can make intelligent decisions. This very often actually retards progress in the organization and serves to discourage individual effort upon the part of the local mill management.

A high-grade consulting engineer employed to devote his entire time to the corporation's affairs would be a very valuable asset. He should conduct himself toward each individual plant exactly as he would if they were all independent establishments and his own clients. There would be this very important difference, however, which would mean much greater freedom of action, *i. e.*, he would be entirely free to give each plant the benefit of his experience in others, and in this way would be a constant, highly intelligent means of exchanging ideas of mutual interest and benefit.

Of course, I realize that most of this is a review of things already known to many of you, but this review seems to me to be necessary in order to properly present what, I hope, will be more constructive in nature.

I am now going to make a plea for the development of plant individuality. This is not merely a return to old conditions existing prior to amalgamation, but a regaining of all the advantages of the old order of things with the additional advantages of the new.

To begin with, we must have managers in our plants who have real executive ability and who are not selected because of their particular skill in certain manufacturing lines. These managers should have power to select and form their own organizations, and for this reason must be men who have a broad realization of their unity with the parent corporation. They should be the kind of men who are ready to receive suggestions and receive them gladly and at the same time have individuality enough to reject those things, which from their knowledge of conditions, seem unwise to incorporate.

Having selected this type of manager, the work of developing the organization's individuality can begin.

A good organization must have the following elements:

1st. A certain definite function to perform.

2d. A definite central organization of control.

3d. A thorough system of recording all events which take place in the performance of the work.

4th. Means for vitalizing certain subconscious functions of control so as to produce prompt, intelligent action without direction from the conscious mind.

5th. Means for making newly acquired accomplishments automatic.

In other words the question resolves itself into developing in the plant as a unit all of the functions so wonderfully exemplified in the human body.

Recognizing the principle that any organization to be progressive must have individuality, let us see how this individuality can best be built up. To do this we must have some knowledge of what constitutes individuality, and I know of no better way to illustrate this than by showing how unity of action is maintained in the organized activities of the physical body.

The mechanism which enables the human body to act as a unit is the nervous system, which controls, either consciously or subconsciously, every bodily function. We have thousands of afferent (or in-going) nerve paths leading from every portion of the body into the central nervous system, where every external impression is finally recorded in the cortex of the brain.

The end organs, which enable us to see, hear, smell and taste, all have their nerve paths leading to the brain, and we find upon analysis that what we once called the sense of touch is wonderfully differentiated into various senses, as, for instance, the thermal sense (of hot and cold), the pressure sense and the sense of pain, each conducted inwardly by a special set of nerves, which respond only to its particular kind of stimulation.

We find that all of the nerve paths lead to the brain through various relay stations, or nerve centers, for an intelligent kind of sorting or grouping of the impulses that take place, so that the final presentation to the brain is in proper form for recording.

We find also that while all impressions are in some way recorded in the cortex of the cerebrum, that many of the nerve impulses producing them (in nerve centers through which they pass) act directly upon certain efferent (or outgoing) nerves, whose function it is to produce musculo-motor action in the body; this resultant action taking place before the conscious mind has had time to direct it.

A study of the cortex of the brain, which is the seat of all consciousness including memory, self-consciousness, and volition, reveals a wonderful mechanism for co-ordinating and relating our sense impressions and musculo-motor action; for instance, the sense of violin playing has its seat in close proximity to the musculo-motor center which controls the motion of the arms; in other words, the place where the final recording of an external impulse takes place is close to and always associated with impulse terminals of a similar nature and at the same time with those nerve cells which can enable the individual to further the action required for the proper development of an accomplishment.

In addition to the foregoing, which has to do principally with the conscious action of the mind, we find a wonderful control of the bodily functions by the brain, which keeps the various organs in harmonious relationship with each other. When, for instance, the environmental conditions demand heavy muscular action on the part of the individual, and there is a waste of muscular tissue and a demand for its removal, the nerve which accelerates the heart action is stimulated and increased circulation results, enabling the blood to carry material for restoring the body tissues to their normal condition and carrying away waste products. At the same time that the heart is accelerated, the lungs are caused to increase their rate of respiration through stimulation of the nerve accelerating the motion of the diaphragm. Many other things too numerous to mention occur simultaneously, such as the operation of the sweat glands to assist the organs of elimination to carry off the waste products, etc.; but enough has been stated to illustrate the point I wish to make, namely, that the whole unity of action is made possible only because of the marvelous control exercised over the body by the nervous system. It is only when this control is lost, through disease or injury, that the unity of action and consequent definiteness of purpose upon which progress depends is impaired.

In order to understand the reason for the simplicity and wonderful unity of the nervous system in spite of its apparent infinite complexity, it is necessary to describe its three great subdivisions:

The *sympathetic system.*
The *spinal system.*
The *cortical system.*

Take first the sympathetic system, which is the seat of those almost entirely automatic functions over which the conscious mind has only very indirect control. This consists principally of the efferent (or out-going) nerve cells, whose bodies are collected into ganglia, or groups, located outside of the spinal cord, principally in the head and in the body cavities. For instance, the nerves which stimulate the growth of the hair, the finger-nails, and even the growth of the body itself; the vaso-constrictor and vaso-dilator nerves controlling the contraction and expansion of the blood vessels; the nerves controlling the beating of the heart and thousands of other functions are all a part of the *sympathetic* nervous system. This is so designed that it constantly reminds and, in a sense, releases the forces required to keep the routine work necessary to our preservation in motion.

Next let us take the *spinal system,* which is located inside of and protected by the backbone. This is the seat of those semi-automatic functions over which the brain has a direct and constant control. These functions—such, for instance, as walking or breathing—after once being set in motion by the will, acting through the brain, or conscious mind, are kept in motion by the nerves in the *spinal* cord without the conscious effort of the individual. It is also the seat of the so-called "reflex muscular action," which causes the body to act involuntarily for its own protection, when necessary.

The fundamental difference between the subconsciousness of the *sympathetic system* and the subconsciousness of the *spinal system* is that the stimulating nerve power of the latter is more or less directly under the control of the conscious will, while the sympathetic system performs its work independently of it.

Finally, let us describe the *cortical system,* which is really an outgrowth of the spinal system, surmounting it, co-ordinating and controlling its action. The upper portion, or cortex of the brain, is the seat of the memory, where all the sensory impressions from every portion of the body are brought by the afferent (or in-going) nerve paths, and from which originate the efferent (or out-going) impulses, which keep the body functioning properly in accordance with its environment. The will, having the power to recall and use the stored-up records in the brain, can, by means of communicating nerve fibres in the cortex, direct the organism through its outgoing nerves to useful efforts of progressive accomplishment.

Having described the functions of the three main divisions of the nervous system, it now remains to sketch briefly the relationship of each to each other.

The *sympathetic* nervous system is connected, through what the anatomist calls the "preganglionic nerves" with the brain and spinal cord and comprises the outlying efferent (or out-going) nerve cells, through which the impulses from the central nervous system finally reach the involuntary muscles and glands; the spinal cord connections coming out between the spinal vertebrae, and the direct brain connections being made through the cranial nerves coming down from the cortex direct. The so-called sympathetic nerve cells are connected into ganglia (or groups) located as before mentioned in the head and body cavities. The various nerve plexes, such as the pulmonary and the solar, are also a part of the *sympathetic* system, and the connections into these ganglia and plexes, coming from both the cranial nerves and the spinal nerves, complete the cycle which produces a harmonious working together of the parts and a continuous correcting or complementing action.

I could go on almost indefinitely with illustrations of this nature, but enough have been given to bring out the point I wish to make, namely, that the human body is an organization of many elements (and I might say of many personalities, for each cell has individuality of its own, and many can live outside of the body itself), all working together in harmony, under the direction of the will, acting through the nervous system.

If any one wishes to inquire into the forces which have led up to the individual development of mankind, he will find himself at once plunged into the realm of psychology and mental philosophy. I can heartily recommend such a course as immensely profitable and of practical value.

The five important facts, however, that have to do with the subject in hand are:

1st. That the human body is such a wonderful organization because it is the product of the forces of creation, acting through millions of years of evolution.

2d. That its capacity for progress depends upon the maintenance of the unity resulting from this creative evolution and upon a conscious recognition of this unity.

3d. That this unity would not have been possible without the development of the nervous system.

4th. That the conscious intelligent progress made by mankind could not have reached its present level until in the process of evolution a mechanism had been built up in the nervous system itself capable of recording the various impressions which the senses are constantly receiving.

5th. That the recording of past events, with the power of consciously recalling them for the solution of problems immediately confronting it, is absolutely essential to its development.

Now, what I want to point out is that inasmuch as man's progress depends upon the perfect co-ordination of his forces to produce unity of action, we have no right to expect an industrial organization to make progress (which it must do as a unit) without the establishment of a conscious co-ordinating mechanism similar to the nervous system in the human body.

Is it not a fact, then, that the success of scientific management, properly applied, is due to its action in building up the individuality of the organization? I think there is not the slightest doubt on this point, nor is there any doubt that the failure of some organizations to put their business on a scientific basis has been caused largely by the fact that they have not used the mechanism of scientific management for the purpose of perfecting its unity.

I am personally very familiar with one large, flourishing establishment, which has no less than one hundred recording and one hundred indicating instruments, representing twenty or more different kinds of sensory impressions, such as temperatures, pressures, colors, gas compositions, liquid densities, liquid levels, etc., all required in order to maintain uniformity of product and economy of operation.

Recognizing, then, these various recording devices and instruments which come in direct contact with the work as the end organs of newly acquired senses, we must conduct the impulses resulting from the instrumental contacts through suitable channels to the place where all things affecting the organization are recorded.

We must have, in other words, an organization memory, which is entirely apart and separate from the memory of the various individuals of the plant. It is only by having such a place of record, where all things affecting the organization as a unit can be recorded, that a proper perspective can be obtained.

A gradual development of such a memory by the addition of new senses will tremendously accelerate the rate at which the organization will progress, just as in the individual the addition of new concepts to the brain tremendously increases its reasoning power.

In designing the recording mechanism, or plant memory, it is best to use graphical methods in order that comparisons may be easily made. Figures, it must be remembered, are static, while curves show tendencies.

By the use of graphical records, things affecting each other can be brought in close relationship, enabling those whose business it is to control the manufacturing process to see at a glance what action is necessary on their part to produce the best results, not only with respect to their own department, but with respect to the whole plant.

If I had time, I would like to describe to you in detail a chart room containing over 1,400 separate plotted records, all used to record the operations of a single plant. These charts are so arranged and grouped as to be instantly and at all times available for study by those directing the organization's activities. This department is the plant memory and corresponds to the third and last acquired great subdivision of the human nervous system,—the brain.

Having described the memory part of the organization as corresponding to the cerebrum of the brain, let us now consider the part corresponding to the spinal cord, which is the seat of what we will call the vital or intelligent subconscious action. In our industrial organizations this corresponds to the control by the department heads and foremen, who are constantly directing and setting in motion corrective forces tending to keep the organization functioning properly. This is analogous to what the anatomist calls "reflex action."

Now, in the average organization, much of the work is done in this manner without direction from the central conscious mind. There being no plant memory, this is the only way it can act and progress is necessarily extremely slow, as it is, for instance, in the insect world where the spinal system is not surmounted by a brain.

As the co-ordinating effect of a brain, however, enables the spinal cord to do much better work, so does the addition of a plant memory tremendously aid by intensifying the subconscious action; as, for instance, when it acts through its executive branch to stimulate the creative energy of the foreman, sub-foreman, and even individuals, by giving them a record of the performance of their work and by making comparisons with others. By this means a spirit of emulation is built up which makes each man desire to do good work of his own free will. The urge comes from within instead of from without. The result of having this spirit permeate the organization means an entire reversal of the old order of things, where the chief executive uses his creative force to make his department heads carry on their work and they in turn pass the impulse along to their foremen and so on until it reaches the last man in the organization, where it is felt very faintly indeed.

The new order carried out to its ultimate point means that each man in the organization is interested because those above him have had brains enough to furnish him with the means of recording his progress. He then feels that he is creating something and is happy. His foreman, being released from the tedious work of making his men work against their will, finds stimulation in directing the forces he feels flowing upward for him to direct. As a consequence, he becomes creative in his work.

The department head has the same experience and finally the chief executive finds himself directing the forces looking to him for leadership and he himself becomes creative and no longer wears himself out by trying to drive his own creative force into the men in his organization, thereby depleting his own supply.

Finally, let us take that part of the organization corresponding to the *Sympathetic Nervous System,* for it has a very important place in our scheme of rounding out the organization's individuality. Much of the organization's activity must become automatic, otherwise our capacity to acquire new accomplishments will be greatly limited. Man's progress in the world consists largely in the conscious acquisition of new talents and making them subconscious, or automatic. We begin this when we, as children, consciously learn to walk and later in life, perhaps, learn by dint of hard work, to ride a bicycle. Once having learned these things, we no longer have to think about them, but our minds, while we are doing them, are released for other purposes.

Now, in our plant organization there is no better method of installing a subconscious control than by the use of a Tickler system, as it is used in the Taylor system of Scientific Management. This consists simply of a cabinet with a drawer for each month in the year, containing substantially built folders for each day of the month. In these drawers are placed the various memoranda, to be taken out and distributed on the proper dates, reminding those to whom they are addressed of certain routine work to be done. A system, so safeguarded as to keep the conscious mind of the organization informed when a departure is made from methods decided upon as best, or made so responsive to changes in plant conditions as automatically to allow the executive branch to know when conditions should be changed, is fulfilling a long felt want. I can describe to you a thousand ways in which such a system is serving a large industrial concern and enabling the conscious mind of its executive, department heads, foremen and others to do creative work for its advancement.

There are many other functions which can be brought into use, all of them having exact counterpart in the human body, nor is there any end to the elaboration of methods. I will not weary you, however, with any more details.

I want now to state, in as few words as possible, what seems to me are the essentials of organization work. The first thing to decide upon is what constitutes individuality. The units must be no larger than they should be to function properly as units in the performance of a common task. If the corporation ownership is large, divide it into these units and make them come into the parent organization as complete units.

Having determined your units, give them individuality in the following manner:

1st. Furnish them with means of becoming conscious of themselves and of their environment, by building up a system of scientific registration and control similar to the nervous system of the human body.

2d. Provide a definite central place for recording all of the various sensory impressions furnished by the recording mechanisms, arranged in such a way that comparisons of the whole progress of the plant can be made with the least possible effort, exactly as it is done in the brain of the human body.

3d. Provide for the subconscious control of the newly acquired accomplishments as exemplified by the *Spinal* and *Sympathetic* nervous systems in man, thereby liberating the conscious mind to deal with new problems of a creative nature.

If these three functions of management are kept in mind there will be no danger of becoming confused by the mechanism of control, for it will always be seen to be what it really is,—namely, the nervous system in progress of development in order to establish greater unity of organization.

Furthermore, a thorough recognition of these three cardinal principles for establishing unity of action is a perfect safeguard against over systematizing. The human nervous system is extremely flexible and always more or less under the control of the will and it is of the utmost importance that the mechanism for controlling and unifying an industrial organization be equally flexible and capable of being modified.

An organization filled with red tape is like a man who has lost his will power and is dominated by his appetites and desires. He cannot become efficient until the will regains control and restores unity of action.

Any system so designed that it does not permit the intimate contact of employer with employee and therefore does not fully recognize the value of the human touch is doomed to failure.

I sincerely hope that in outlining this philosophy of management I have indicated to you how an organization can be made so conscious of itself as to realize at once when the human units, of which it is composed, are not being given the proper opportunity for self expression; or to realize as well when these same human units are not receiving the sympathetic help they need for their own individual development.

Men can be productive only when they take an interest in their work and they will not take this interest unless those entrusted with the direction of their efforts realize that they must teach them constantly how to exercise their creative powers.

In conclusion, I wish to assure you that this paper is not an academic discussion of what might be done, but as true a picture as I can give you of methods I have actually used successfully.

DISCUSSION

Mr. Shelton: Mr. Wolf has drawn an exceedingly interesting analogy, well calculated to help managing members of an industrial organization keep their balance. Yet he does not seem to stick to his own parallel. For instance, the autonomy which Mr. Wolf would give the accounting departments of the different local organizations in a large corporation does not seem consistent with his picture of centralized control over bodily activities such as is exercised by the cranial system. If the central office of the corporation can determine the one best way, whether in accounting or any other practice, should it not hold the subsidiary plants responsible for living up to that standard? The central office, it seems to me, should be in a peculiarly advantageous position in the establishing of proper standards. Therefore, I take issue with Mr. Wolf's contention that its relation to local plants should be purely advisory.

The suggestion that an industrial organization to make progress as a unit should have a conscious co-ordinating mechanism comparable to the nervous system in the human body is hardly open to argument. Neither is it open to argument that every organization can and should have a distinct individuality as a whole, to which its component parts harmoniously contribute. The question whether Scientific Management helps to build up such an individuality can certainly be answered in the affirmative. But the statement that "the failure of some organizations to put their business on a scientific basis has been caused largely by the fact that they have not used the mechanism of Scientific Management" seems to me absolutely wrong.

Tickler systems, recording devices and indicating instruments are mechanisms, valuable and often necessary. Yet Scientific Management does not lie in these. How often have we heard Mr. Taylor emphatically declare that Scientific Managerment is not a particular mechanism of any sort, but is primarily a point of view! That, it seems to me, indicates the secret of success or failure in Scientific Management. It depends not on the mechanism, but on the individuality which controls and uses the mechanism.

Taking Mr. Wolf's own analogy:—Mr. Taylor's cerebro, spinal and sympathetic nerve systems were built on much the same plan and of much the same material as those of the rest of mankind. Yet consider the difference in the way he,—in his individuality—his point of view—used those mechanisms and with what results!

Mr. **Mixter**: The paper says that an organization filled with red tape is like a man who, having lost his will power, is dominated by his appetite and desires. I think it is the other way round, that a concern dominated by red tape is like a man with excessive will power who has a fixed idea and who will not change or changes with great difficulty. I think in all human affairs whether government or industry we never can achieve anything that approximates the co-ordination of the human person. As regards the different plants under one central ownership, the problem is very much the same as the problem of controlling armies in the field in time of war. What the general staff does is to plan in advance and then the plan is executed and the two great modern innovations have been the very thorough planning in advance and also learning this lesson as it never was learned before, of never interfering with commanders. Scientific management as to planning in advance is very similar to the work of the general staff. In practice does scientific management do the other thing just as well? Isn't there a little too much of a tendency to control everything from the planning room?

As regards the personality of persons in a particular plant, it seems to me that the only thing that you can do about that is to have a working suggesting system and have every one in the planning room or in the shop realize that any idea he has that he thinks will benefit the work in any way will be considered and if found to be good will be adopted and he will be given credit for it in some money award or by publishing his name, and so given the full credit for it. It seems to me that nothing is more deadening to individuality than for clerks and foremen and others to feel that they are not given credit for suggestions of that sort. The spirit of the thing is that suggestions for improvement are welcome. Clerks and foremen do see many ways in which things can be improved and if they do not feel that they will be given a sympathetic hearing, it takes the heart out of them and they have no individuality.

Mr. **Feiss**: The plant is more than a building, a set of machinery, or a routine system or any mechanical device. Its ultimate success is the result of a group of individuals and is an expression of that type. Each plant I have been in has a certain type of management and a certain type of workers. I have seen two plants in the last month under exactly the same methods. They are under scientific management and still the whole organization of the plants is different. They express something, and the thing that impresses me is the type of worker and how much that type is in its expression similar to the type expressed by the personality of the management. When you get into the bigger organizations where plants in different localities are under one general management it seems to me that the point is well taken, that it is impossible to perform certain personal functions from a central location. After all, plant management is a little more than keeping a few machines running and keeping the building open. The building up of organization depends on the personal contact between the managers and their employees. That cannot be controlled in any of its expressions by anybody except the men on the job. In fact, in my opinion, that is the ultimate key to success. I believe that there is a limit in management to this expression and whenever a plant is so large that the individuality of the plant ceases to exist, that personal contact no longer is there, that it is too large to be efficient. It seems to me that is the very reason why a large controlling company does not locate all its manufacturing under one roof. There is a limit to what one man can personally do. Somebody who is on the job is essential to get the utmost efficiency and that expression of individuality which means real management and real success.

Mr. **Scoville**: I was impressed by what the author of the evening said about recording instruments. I attended a little convention of paper manufacturers at Erie, Pa., which was presided over by a number of extremely methodical Germans. In going through a plant an American that I knew pointed out a paper machine that was running at high speed and said "Look at that gauge go", and I read several hundred revolutions a minute. I said, "Is that fast?" and he said that it was. I asked, "Why don't the others go fast?" And he said, "Mostly because they don't know how. In most paper mills they take a piece of white paper about so long (indicating) and they have some contrivance for sticking it in, and the man has to depend on his eye." A great deal of the success which those paper industries in Erie have obtained is due to the competent and systematic use of their recording instruments. That is an example that many of us will follow, and when they get recording instruments that will do what our speaker told us about, they will plot it out.

Mr. **Valentine**: Mr. Feiss struck the note that appeals to me. I felt just one lack in Mr. Wolf's paper. I felt there were a lot of things down the line that his scheme of things could not take into account. I missed the idea of will power all the way through. It seems to me that the danger that those of us who have scientific management most at heart see for scientific management, is that it shall not be adequately scientific and that it shall not sufficiently take into account the constant, continuous and forever-and-ever-amen uncertainties of things that make life both a success and a failure.

Mr. **Wolf**: I am glad that Mr. Valentine has pointed out that my paper apparently does not appear to put sufficient emphasis upon the human will, for I will try to correct this impression. Perhaps I took too much for granted that in comparing the organization with the human body this feature would be clearly understood. My effort has been to describe how an organization can be built up, which will allow the greatest possible latitude for the expression of the individual will.

The manager and all of his assistants must be in close touch with the men and easily accessible to them at all times.

The position taken by Mr. Feiss is very much to the point, namely,—that a plant is more than a set of machinery, or a